PRICE 15¢

PERIODICAL ROOM
GENERAL LIBRARY
UNIV. OF MICH.

OCT 9 19

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •

OCTOBER 6, 1934

A Most Transparent Theft

See Page 222

A SCIENCE SERVICE PUBLICATION

SCIENCE NEWS LETTER

VOL. XXVI *No. 704*

The Weekly Summary of Current Science

Published by

SCIENCE SERVICE

The Institution for the Popularization of Science organized under the auspices of the National Academy of Sciences, the National Research Council and the American Association for the Advancement of Science.

Edited by WATSON DAVIS

Subscription rates—$5.00 a year postpaid; two years $7.00; 15 cents a copy. Ten or more copies to same address, 5 cents a copy. Back numbers more than six months old, 25 cents.

Canadian and Foreign subscribers please add $1 a year to regular subscription rates to cover postage.

In requesting change of address, please give your old address as well as the new one in notification to Circulation Department, SCIENCE NEWS LETTER, 21st and Constitution Ave., Washington, D. C., at least two weeks before change is to become effective.

Advertising rates furnished on application.

Board of Trustees of Science Service

Honorary President, William E. Ritter, University of California. Representing the American Association for the Advancement of Science, J. McKeen Cattell, *President*, Editor, Science, Garrison, N. Y.; Burton E. Livingston, Johns Hopkins University, Baltimore, Md.; Raymond Pearl, Director, Institute for Biological Research, Johns Hopkins University, Baltimore, Md. Representing the National Academy of Sciences, W. H. Howell, *Vice-President and Chairman of Executive Committee*, Johns Hopkins University, Baltimore, Md.; R. A. Millikan, Director, Norman Bridge Laboratory of Physics, California Institute of Technology, Pasadena, Calif.; David White, Senior Geologist, U. S. Geological Survey. Representing National Research Council, Vernon Kellogg, Secretary Emeritus, National Research Council, Washington, D. C.; C. G. Abbot, Secretary, Smithsonian Institution, Washington, D. C.; Harrison E. Howe, Editor of Industrial and Engineering Chemistry, Washington, D. C. Representing Journalistic Profession, John H. Finley, Associate Editor, New York Times; Mark Sullivan, Writer, Washington, D. C.; Marlen E. Pew, Editor of Editor and Publisher, New York City. Representing E. W. Scripps Estate, Harry L. Smithton, *Treasurer*, Cincinnati, Ohio; Robert P. Scripps, Scripps-Howard Newspapers, West Chester, Ohio; Thomas L. Sidlo, Cleveland, Ohio.

Director, Watson Davis; Staff writers: Frank Thone, Emily C. Davis, Jane Stafford, Marjorie Van de Water, Robert Potter; Librarian, Minna Gill; Sales and Advertising Manager, Hallie Jenkins.

Copyright, 1934, by Science Service, Inc. Republication of any portion of the SCIENCE NEWS LETTER is strictly prohibited since it is distributed for personal, school, club or library use only. Newspapers, magazines and other publications are invited to avail themselves of the numerous syndicate services listed by Science Service, details and samples of which will gladly be sent on request.

Members of the American Association for the Advancement of Science have the privilege of subscribing to the SCIENCE NEWS LETTER at the reduced price of $3 per year. Application for this privilege should be accompanied by privilege card obtained from the Permanent Secretary, A. A. A. S., Smithsonian Institution Building, Washington, D. C.

Publication Office, 1930 Clifton Ave., Baltimore, Md., Editorial and Executive Office, Constitution Ave. at 21st St., N. W., Washington, D. C.

Address all communications to Washington, D. C. Cable address: Scienserve, Washington.

Entered as second class matter October 1, 1926, at the post-office at Baltimore, Md., under the act of March 3, 1879. Established in mimeographed form March 13, 1922. Title registered as trade-mark, U. S. and Canadian Patent Offices.

DO YOU KNOW?

The mule deer is the most important species of game mammal in California.

A recent landslide at Lyon, France, helped to uncover a Roman amphitheater.

A way of feeding milk to fish has been devised: flakes of dried milk food insoluble in water.

Swordfish, joining the ranks of cod and halibut, produces a liver oil rich in vitamins A and D.

There are 98 reporters who keep track of ice conditions on the Great Lakes for the Weather Bureau.

Contrary to common belief, the eating quality of old carrots is as good or better than that of young carrots.

Tax experts have figured that a one-cent rise in the gasoline tax rate leads to a decreased consumption of gasoline of about five per cent.

Commercial efforts are being made in China to increase milk drinking.

Lobsters are said to live 20 years or more—if they are able to survive the hazards that beset them.

A British scientist comments that London's streets have been efficiently drained and paved only twice in the city's entire history; in the day of the Romans, and during the past hundred years.

Hungarian soap makers are turning out soap cakes with bakelite tablets in the middle bearing the factory's name or trade-mark, thus reminding the user of the brand when the soap is about used up.

A test pilot predicts that unless the technical improvements of aircraft are simplified it will eventually be necessary for a pilot to have a doctor's degree in engineering from a university before he will be able to fly a plane.

WITH THE SCIENCES THIS WEEK

ARCHAEOLOGY

What preserved the wooden handle of a dagger for centuries? p. 215.

Why is the Payne collection of Indian relics famous? p. 213.

ASTRONOMY

What is the temperature of the blue-hot stars? p. 216. *Other Worlds—Edwin L. Moseley—Appleton-Century*, 1933, $2.

Where can you look through a telescope at the stars? p. 218.

CHEMISTRY

What nation is the biggest chemical exporter? p. 216.

Why is it difficult to prepare the rare earths in the pure state? p. 212.

GENERAL SCIENCE

How can a scientific outlook be fostered in the public? p. 213.

MARINE ENGINEERING

How might a ship launching end in disaster? p. 214.

MEDICINE

How are pneumonia patients benefitted by decompressing the lungs? p. 217.

How can medical care be paid for? p. 223. *How to Budget Health—Evans Clark—Harper*, 1933, $4.

Why is craft work not to be emphasized in treatment of the tuberculous? p. 222.

PALEONTOLOGY

What sort of treasure is being mined at You Bet? p. 211. *Plants of the Past—Frank H. Knowlton—Princeton Univ.*, 1927, $3.50.

PATHOLOGY

What is an "ultravirus"? p. 220.

PHYSICS

How are two radio beams made to cancel each other? p. 215.

What instrument measures inaudible sounds? p. 212.

What prevents the sunlight from killing plants and animals on the earth? p. 222.

PHYSIOLOGY

What is the shortest wavelength visible to human eyes? p. 216.

PSYCHOLOGY

Can medical treatment add to intelligence? p. 214.

Are the brains of idiots physiologically different from those of normal persons? p. 216.

What part of the brain determines the ability to hold in mind different aspects of a problem? p. 221. *Almost Human—Robert M. Yerkes—Century*, 1925, $3.

SOCIOLOGY

What nativity-group has the lowest crime rate in this country? p. 211.

ZOOLOGY

What monkey lives in a land of snows? p. 216.

These curiosity arousing questions show at a glance the wide field of scientific activity from which this week's news comes. Book references in italic type are not sources of information for the article, but the references for further reading. Books cited can be supplied by Book Department, Science News Letter, at publishers' prices, postpaid in the United States.

SOCIOLOGY

Alien Crime Wave High, But Low for German Immigrants

Law Tries to Bar at Border Criminals Like Hauptmann, Yet Alien Crime Rate is Higher Than for Native Born

By DR. HARRY H. LAUGHLIN,
Carnegie Institution of Washington

IN VIEW of the fact that Bruno Richard Hauptmann, an alien German deportable from the United States and now in custody, is accused of one of the most infamous crimes in recent American history, the questions again arise: Why are alien criminals admitted to the United States? What nations or races contribute relatively the greatest number of alien criminals? How does the law try to keep them out? Why does the law fail? Although our law sets an allowable crime quota for each alien population-group at zero, and strives to debar potential criminals at our ports and borders, and to deport actual criminals after due punishment, our alien crime-rate still practically equals that for our population as a whole.

In computing the crime rate for any section of the population—say that of a given alien race—it is necessary to have two figures: first, the total population of the particular population-group; and second, the number of persons within such population section who fall within the definition of a "criminal." For the present let us define a criminal as an inmate of a State or Federal institution for the criminalistic classes.

An Index of Assimilation

Roughly, if we say that a crime rate less than that for the population as a whole is an index of more ready assimilation, and that a crime rate greater than the average is evidence of non-assimilation, the following series is of interest. It contains comparative figures indicating the crime rates for different nativity groups within the United States.

The figure for Switzerland is only 27, Ireland 31, Germany 35, Scandinavia 35, Northwestern Europe 37, Great Britain 43, Netherlands 58, Canada 65, Austria-Hungary 68, native white both parents native born 81, native white both parents foreign born 91. The figure for the whole group of foreign born residing in the United States is 98.

The following groups are those whose figures are above the one hundred mark, Their crime rate is higher than for any of those preceding. The figure for native whites having one parent native and one parent foreign born is 115, France 123, Old Russia 126, Southern and Eastern Europe 141, Rumania 141, Japan 153, Portugal 185, American Negro 207, Italy 218, Turkey 240, all Asia 251, all Balkan States 275, Greece 293, West Indies 318, China 337, Bulgaria 366, Mexico 549.

Based on Survey

These rates are based upon a study of the inmates of 155 State and Federal custodial institutions, made for the Committee on Immigration and Naturalization of the House of Representatives in 1923. Another survey made a decade later, 1931-34, computed absolute numbers only, but indicated no radical departure from the earlier findings.

One piece of evidence of the assimilation of an immigrant population-group with the United States is the amount of crime committed by—or rather the number of criminals found within—the particular immigrant group. The more consistent obedience to law, that is, the fewer crimes committed, obviously the more complete the Americanization.

The United States has received desirable citizens from every white race in the world. It has also received degenerate and very undesirable citizens from every white race in the world.

The crime index is only one evidence by which the receiving nation can judge its would-be immigrants—the parents of future Americans. Not only freedom from all kinds of social inadequacy besides crime, but (*Turn to Page* 220)

PALEONTOLOGY

Gold Mining Operations Produce Fossils Also

GOLD is being washed out of California hills again, since the jump in its price made hydraulic mining profitable once more. But there is more than gold in "them thar hills." Along with the auriferous gravels brought down by the great streams of water from the high-pressure nozzles, great quantities of plant fossils, valuable to science, are being produced.

At You Bet, one of the camps famous in the roaring days of '49, Harry D. MacGinitie, paleobotanist of the

MINING BY WATER

These streams, under enormous pressure, eat into the banks at You Bet, where gold and fossils are being recovered.

DEVIL'S CLUB

That is the awesome name of the tree from which this fossil leaf came. The tree, whose scientific name is Aralia, is one of the most common of California's fossil forests. The leaf is one of more than forty kinds found at You Bet.

University of California, is picking over the placer washings for nuggets of knowledge. Thus far he has found more than forty kinds of fossil leaves, including figs, magnolias, palms, sycamores and avocados. This makes up a complex of plant growth quite alien to the You Bet region of the present day, and indicates that California of the far past had an even warmer climate than the California of today enjoys.

Science News Letter, October 6, 1934

CHEMISTRY

Electrochemical Method Used To Concentrate Rare Earths

A NEW method for concentrating many of the so-called rare earth elements, whose purification has baffled chemistry for years, was presented to the meeting of the Electrochemical Society.

Prof. B. S. Hopkins of the University of Illinois' chemistry department told of his new experiments with salts of the rare earths in collaboration with Dr. L. F. Audrieth. Prof. Hopkins is famous for his discovery, in 1926, of the element illinium, a metal with valuable properties.

The rare earths have atomic numbers from 57 to 71 in the periodic table of the chemical elements. They are seldom shown on the familiar classroom charts because they unduly complicate the classification of the elements in a systematic arrangement.

Minerals containing the rare earths occur chiefly in Scandinavia, the Urals, America, Brazil, India and Australia. Owing to the extraordinary chemical similarity of the members of the rare earths and to the further fact that they are associated in nature, it is very difficult to separate them and to prepare them in the pure state. Prof. Hopkins' report to the society describes a new method for solving this problem, at least in part.

The first stage in the concentration of rare earths, reports Prof. Hopkins, is to mix them with mercury, for which they have a great affinity. Mercury amalgams of the rare elements are thus obtained.

The preparation of mercury amalgams is not the easy process used by dentists in making silver amalgams for dental fillings. It is necessary to use electrochemical processes where the conducting solution is mercury chloride.

Rare earth amalgams prepared electrochemically, Prof. Hopkins indicates, are liquid or pasty masses containing from one-half to three per cent. of the rare earth metal by weight. The amalgams are easily decomposed by exposure to air and moisture. They must be preserved in a vacuum or in an inert atmosphere like neon, argon or helium.

"The amalgams may serve as the starting point for the preparation of the corresponding rare earth metals," Prof. Hopkins cautiously concludes.

Science News Letter, October 6, 1934

PHYSICS

New Instrument Measures Heat of Various Sounds

WHILE the music of some of the popular orchestras of the radio is often referred to colloquially as "hot," scientists at the Massachusetts Institute of Technology have devised new and more accurate methods of determining the heat of sound.

Instead of measuring sound variations in terms of air pressure as does a microphone, the new sound thermometer records the alternating temperatures produced by sound waves travelling in air.

The device was developed at the Round Hill estate of Col. Edward H. R. Green, M. I. T. research station near South Dartmouth, Mass., by Ellis A. Johnson of the Institute under the direction of Prof. Richard D. Fay and Prof. Louis Harris.

The sound thermometer is essentially an exceptionally delicate thermocouple comprising thin metal strips of dissimilar metals, bismuth and antimony for example. Each strip is but .00001 centimeter in thickness and is mounted on cellulose acetate films of the same thickness. Together the film and strip are mounted on a thin mica frame.

The thinness of the metal strips may be appreciated when it is realized that a million of them together would make a pile not much more than an inch

thick. The amplifier used to "step up" the tiny electrical current generated at the junction of the two dissimilar strips of metal by the heat of sound, is capable of responding to one one-hundred-millionth of a volt.

The thin metal strips or films are so delicate that they do not disturb the sound field they are measuring as do other devices. The sound thermocouple with its amplifier is about 100 times more sensitive than previous couples. It is capable not only of recording the minute variations in temperature produced by sound waves but of recording these variations when they are occurring thousands of times each second.

Already the new device has been used to measure the adiabatic heat produced in a sound field up to frequencies of 10,000 cycles a second, and its range can be extended to 300,000 cycles.

The delicacy of the thermocouple makes it an excellent instrument for measuring sound which the ear can not hear, and it is adapted also for light measurements.

Science News Letter, October 6, 1934

ARCHAEOLOGY

Urges Museum Purchase Of Indian Collection

HOPE that the vast Payne collection of Indian relics will be acquired by some educational institution or museum, so that its features of scientific value may be preserved, is expressed by Dr. Warren K. Moorehead, well-known archaeologist of Phillips Academy at Andover, Mass.

The collection, left by the late Edward W. Payne, of Springfield, Ill., is famous because it is so enormous that only three or four museums outrank it in numbers of Indian antiquities.

Dr. Moorehead and several other archaeologists are planning to examine portions of the collection, he stated. Dr. Don Dickson of Lewistown, Ill., has charge of the collection.

From previous examination of portions of the huge array of pipes, blankets, and other articles at various times, Dr. Moorehead has estimated that there are at least half a million objects from the Mississippi Basin alone.

Since the death of Mr. Payne, in 1932, the fate of the collection has hung in the balance, and archaeologists have hoped that its features of scientific importance would not be lost by indiscriminate scattered sale.

Science News Letter, October 6, 1934

GENERAL SCIENCE

Editor of British Journal Urges Science Service There

Significance of Scientific Discoveries in Daily Life Should be Pointed Out by Competent Writers

A STRONG plea for cooperation between science and the press in Great Britain along the lines of Science Service in America was voiced by Sir Richard Gregory, Bart., editor of the British science journal, *Nature*, in his presidential address before the Association of Special Libraries and Information Bureaux.

Stating that "most admirable work for science publicity has been carried on in the United States since 1921 by Science Service," Sir Richard said that "it would be to the advantage of science and the newspaper press if similar organizations for science publicity were established in other countries and cooperated with one another in an international science agency.

"Art and letters, music and religion, have their interpreters in the periodical Press and cannot complain of any lack of attention to their works or teaching," Sir Richard said. "In its human interests, science can make just as wide an appeal as any of these, but there are few who can review scientific matters with the independent and critical mind which estimates the value of opinion or performances in other spheres. A bare announcement of a scientific discovery may be worth publication as an item of news, but not much more so than a report that an important creative work has been completed by an eminent artist or man of letters. Supplementary to such news, reasons must be given why the discovery or work is of particular significance; which means that its characteristics must be clearly described by a competent writer.

Duty of the Press

"It is surely the duty of the Press," Sir Richard declared in his concluding remarks, "as a service of public utility and the man of science as a citizen as well as a discoverer, to affect a rapprochement in order to create a public opinion which will ensure that no advantage may be lost which might accrue from the application of the results of scientific research to the needs and amenities of daily life. A more intelligent and more intelligible consideration of scientific work and thought is desirable in the public Press because of their close contacts with many national and international problems. Under the conditions of modern civilization, the community in general is dependent upon science for its continued progress and prosperity. Under the influence of modern scientific discoveries and their applications, not only in industry, but also in many other directions, the whole basis of society is rapidly becoming scientific; and to an increasing extent, the problems which confront the national administration involve factors which will require scientific knowledge for their solution.

Service to Science and Public

"It is in these directions that the Press can render the greatest service to science and the public at the same time. Under the present social and educational system, it is not possible to hope that at any very early date our schools will turn out a population of scientifically-trained men and women. But it is becoming recognized, though slowly too, that what is needed is not so much detailed or expert knowledge of science, as the scientific outlook. The function of the Press, more readily to be appreciated perhaps when something of this scientific spirit has been inculcated in the schools, might very well be, by fostering this outlook, to ensure that the problems of government and administration of society and of economics, are approached with scientific understanding."

Science News Letter, October 6, 1934

Spruce wood from the Northwest coast may well equal European woods for violin making, if carefully selected and seasoned.

That there were camels in Egypt as far back as the Old Kingdom, over 1600 years before Christ, is shown by camel's hair cord from that time.

PUBLIC HEALTH

Anthrax, Gasoline Poisoning Seen as Health Hazards

ANTHRAX is definitely on the increase among agricultural workers in this country and is a definite menace in the wool industry in several manufacturing areas, Dr. Henry F. Smyth of the University of Pennsylvania reported to the American Public Health Association in Pasadena, Calif. The death rate for this disease, except in a few states, shows no tendency to decline, the committee of which Dr. Smyth is chairman found in studying the anthrax situation during the past five years. The best method of treating the disease is by large doses of anti-anthrax serum applied locally and injected into the veins. This treatment must be kept up until definite improvement is evident.

The increasing number of deaths from anthrax is due in part to its increase among agricultural workers where the serum is not available. Wool and wool clothing are frequently sources of this infection. Machinery in a textile mill may become infected and transmit the infection to subsequent materials.

A distinct hazard to both acute and chronic poisoning from gasoline and benzine exists in the petroleum industry, Dr. Smyth reported. These substances act as narcotic poisons and produce injuries to the nerves in chronic cases.

Treatment with calcium, the substance which give bones their hardness, is the "sheet anchor" in cases of carbon tetrachloride poisoning, the committee found on investigation of this industrial hazard. Carbon tetrachloride is the chief ingredient of many cleaning solutions.

However, because it is used as one of several ingredients in certain mixtures, it has often been unjustly blamed for causing harm when some of the other ingredients in the mixture have probably been the real cause of the poisoning, in the opinion of the committee.

Science News Letter, October 6, 1934

PSYCHOLOGY

Gland Treatment Rescues Infant's Intelligence

THE CASE of a child who at two years had the mental age of an infant of less than seven months, or an intelligence quotient of only 28, but who while being fed pituitary gland extract gained in mental ability until at five and a half years it equalled children nearly six years old and had an I.Q. of 103, was reported to the American Psychological Association by Dr. Florence Mateer, director of the Merryheart Schools, Columbus, Ohio.

For 34 children under treatment at Merryheart for diseased pituitary glands, the gain under pituitary feeding has been from 5 to 22 points in intelligence quotient in a year, the gain continuing throughout the period of study, Dr. Mateer reported.

"In general, the younger children improve more, and more rapidly," Dr. Mateer said. "A child of seven or eight may well be expected to gain 20 to 22 months on the Stanford-Binet scale in the school year, with a consequent jump of intelligence quotient of as many as 12 to 14 points in the year."

In a group of 19 Mongoloid idiots, 7 were found who showed symptoms of pituitary disturbance. These have been given feedings of the gland, and have been gaining in intelligence throughout the period of treatment. Five have now reached intelligence quotients of over 78 and one of these now scores 103. A score of 100 is taken as normal.

These promising results have been obtained despite the very complicated nature of the disease. One investigator quoted by Dr. Mateer has estimated that there are at least 8 pituitary hormones with three functional conditions of each. This makes possible at least 6,500 variations of the gland's activity. The picture is further complicated by the body's reported ability to develop an anti-hormone which prevents the influence of the hormone when artificially taken into the body.

Science News Letter, October 6, 1934

MARINE ENGINEERING

Slow Motion Ship-Launching

THE SLIDING down the ways of the giant new Cunarder *Queen Mary* at Clydebank, Scotland, was ship-launching in slow motion. So huge was the vessel that the available deep water in the neighboring Clyde River and the River Cart was only just enough to float the boat. The *Queen Mary* had to be "eased" down the ways rather than allowed to slide in formal fashion.

Ways Almost Level

Launching ways, as everyone realizes, are but inclined planes. For the new liner the incline was so small as to be almost level. As Queen Mary pushed the button releasing the launching mechanism there was no rush of the boat toward the water. Instead four giant hydraulic rams went into action and provided the initial push. Then slowly, with smoking grease from the ways, the vessel slipped gently into the water. Ten minutes, a very long period of time for such an operation, was needed to launch the ship.

Like a lumbering giant chained by a race of lilliputian men the huge hull was slowed up still further by eighteen great chains dragging along the ground. Each weighed 1,000 tons.

Once in the water twenty puffing Clyde tugs pressed against the *Queen Mary's* sides and stayed her speed even though it was but little more than a normal walk; six miles an hour.

Potential Disaster

To the thousands of visiting spectators the launching was a thrill, but one wreathed in all manner of dire rumors of potential disaster. To the shipbuilders at the John Brown shipyard, however, the *Queen Mary* was but another of the giant vessels which have been "born" on this site.

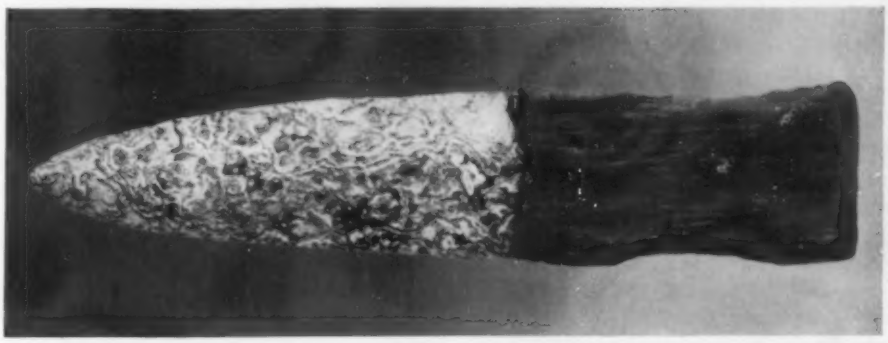
At this place the *Aquitania,* the *H. M. S. Hood* and the *Empress of Britain* have been launched. The dread-

naught *Hood*, in fact, was a bigger job than the launching of the *Queen Mary*. While not so long, the warship was much heavier.

All the work with huge ships has meant that the ground under the ways of John Brown shipyard is thoroughly compressed. There was a possibility but little danger that the ground might sink a fraction of an inch during the launching and turn a thrilling event into a tragic disaster.

Science News Letter, October 6, 1934

When sweet corn is kept in storage, the loss of sugar is about four times as fast at 50 degrees F. as at 32 degrees.



WASHED UP BY THE SEA

This dagger, with handle worn by the grasping hand of some Indian brave, was dropped from a canoe in an unchronicled past, to be washed up again by unusually high waves near Long Beach, California.

ARCHAEOLOGY

Mysterious Ocean Waves Wash Up Indian Dagger

Rare and Beautiful Specimen is Picked Up By Man Strolling on Beach in Southern California

By M. R. HARRINGTON, Curator, Southwest Museum

MYSTERIOUS great waves which have been lashing the coasts of Southern California for the last few weeks have caused great damage to seaside property, but from the standpoint of the Southwest Museum they are not entirely instruments of evil. Thanks to these waves the Museum's Californian Indian collection has been enriched by a very rare and beautiful specimen, a large flint dagger, still equipped with its original wooden handle. This was found on the spit of land lying between Encinitas Bay and the Pacific Ocean, near Long Beach, California, after a particularly heavy assault of the surf.

Found on the Beach

The finder, Dale Shamp, spending his vacation at the shore with his family, was strolling on the beach when he spied the dagger. Although he knew little of archaeology, he realized he had found something out of the ordinary, that belonged in a museum, and he lost no time in taking it there.

The dagger measures, over all, some ten and a quarter inches, of which the wooden handle occupies a little more than four. The blade, skillfully chipped of beautifully mottled gray chert, is two inches wide, and is fastened to the handle with asphaltum. On both sides of the handle may still be seen traces of an inlaid X-shaped pattern, made of tiny white shell beads set in asphaltum.

The dagger probably dates from before the coming of the Spaniards to California. It was probably lost overboard from a canoe and lay buried in the mud of the ocean bottom for centuries, only to be dislodged at last by the unprecedented heavy surf. Preservation of the wooden handle was doubtless due to the mud in which it lay. Many wooden relics of ancient pile villages have been similarly preserved in mud of the Swiss Lakes.

As in the case of the Swiss specimens, the dagger handle showed a tendency to warp and crack as it dried, and it was necessary to soak it many hours in dilute shellac before it could be safely prepared for exhibition.

Science News Letter, October 6, 1934

PHYSICS

Details of Marconi Radio Fog Beacon Explained

THE working principles of the fog navigation radio beacon device invented by Marchese Guglielmo Marconi are now known. Recent press reports of the invention were so fragmentary that scientists in England and America could not determine the mode of operation and weigh the system's value.

To picture the application of the radio transmission one may think in analogy of twin searchlights on a single mounting with a dark zone between the two beams in the center, reports Commander E. C. Shankland to the British journal, *Nature*.

A Silent Zone

Each of the two radio beams, right and left, have distinctive characteristics. Using a sixty centimeter (two feet) long wave as the carrier signal, the right-hand beam sends out signals varying 500 cycles a second. On earphones this frequency sounds like a low-pitched note.

The left-hand beam transmits a 1,500 cycle note, of much higher pitch than its companion. By having the two notes in exactly opposite phase a zone of silence, where the two notes cancel out, is achieved in a central zone between them. This silent zone at a distance of ten miles produces a zone of silence over 555 yards.

Sweeps Like a Searchlight

"To have such a signal fixed in position," Commander Shankland declares, "would be unsatisfactory, as a navigator might assume he was in the silent zone when a breakdown had occurred and the transmitter was not functioning. To guide the ship safely, therefore, the system is continuously swung from left to right of the center line in a manner similar to a searchlight when looking for an object on the water.

"When swinging to the left the beacon sounds a high note, when swinging towards the right it sounds a low note. The change of note takes place when the zone of silence coincides with the line of the entrance of the harbor."

Science News Letter, October 6, 1934

PHYSIOLOGY

Human Eyes Able to See By Ultraviolet Light

THE RANGE of human vision is considerably greater than hitherto suspected, according to latest experiments by Dr. C. F. Goodeve, of the Ramsay Laboratories, University College, London. It has been assumed that no light of wavelength shorter than 4000 Angstroms (about one six-hundred-thousandth of an inch) is visible. Dr. Goodeve and six other observers have now been able to see by ultraviolet light down to a wavelength of only 3125 Angstroms.

The light of this wavelength produces, according to Dr. Goodeve's report in *Nature*, a violet color sensation. In order to see an object clearly by such light it must be within four inches of the eye. The object appears, however, to be about three times farther, the illusion being apparently due to the fact that the ultraviolet rays are more highly refracted, or bent, as they penetrate the eye.

On removing the object to a distance of more than four inches, it appears to recede to a great distance, and suddenly becomes out of focus. It is due to this fact, no doubt, that all ultraviolet light has been hitherto considered to be "invisible."

No vision or fluorescence was obtained with ultraviolet light of wavelength shorter than 3125 Angstroms, probably because rays of that type are absorbed by the protein material of the eye-lens.

Science News Letter, October 6, 1934

ASTRONOMY

Our Own Galaxy Only Half Former Estimated Size

THE STARRY galaxy or Milky Way universe in which we live is only half as large as astronomers have supposed hitherto. Shrinking by half the distances of the stars from the earth, latest researches at the University of Wisconsin by Prof. Joel K. Stebbins and his assistant, Prof. C. M. Huffer, reduce our "island universe" to about the size of the other galaxies that are found scattered about at great distances in the heavens.

Thus once more the part of the universe near us is proved not to be unique.

The astronomical "electric eye" was turned upon 733 stars so hot that they appear bluish in the heavens. All were in the Milky Way. The electric eye measures to a thousand-million-millionth of an ampere the energy sent to earth by stars. With this instrument, which contains photoelectric cell and amplifying vacuum tubes, Profs. Stebbins and Huffer confirmed the presence in the Milky Way of a thin layer of dark scattering material which they call dust particles, whose interfering effect has dimmed the starlight and caused astronomers in the past to judge the stars about twice as far away as they really are.

The blue-hot stars, with temperatures of 20,000 to 30,000 degrees Centigrade, three to six times the sun's temperature, have a reddish hue, and this grows more intense the closer they are to the Milky Way's center. This reddish color is caused by a thin stratum of absorbing material near the Milky Way. The Wisconsin astronomers believe tnat this layer is similar to the dark lanes that we see in other galaxies viewed edge on.

Science News Letter, October 6, 1934

CHEMISTRY

U. S. Still Largest Importer of Chemicals

THE UNITED STATES is still far and away the world's biggest importer of chemicals. In dollars America's imports rose from $70,300,000 in 1932 to $87,400,000 in 1933, according to recent figures prepared by the U. S. Department of Commerce. At the same time, however, a favorable trade balance is shown in that exports exceeded the imports. In 1932 America exported $92,000,000 worth of chemicals and in 1933 the figure mounted to $106,400,000.

The biggest chemical exporter of all was Germany, which sold to other countries in 1933 chemicals worth $162,000,000. Germany's imports of chemicals were only $53,800,000.

Russian and Japanese participation in chemical markets was especially strong in 1933 and the early months of 1934. More Russian chemicals were sold in European markets than ever before, while Japan exported widely to Far Eastern countries.

While Germany maintained first place in the world chemical export market by a sizeable margin, her exports really declined. The United States, the United Kingdom, Switzerland, Japan, Canada and Spain registered gains.

Science News Letter, October 6, 1934

IN SCIENCE

PSYCHOLOGY

Electric Currents Reveal Brain Differences

A NEW clue to the brain conditions behind mental deficiency is to be found in the way in which the muscles of the mentally subnormal respond to electric currents, Dr. George Kreezer, of Vineland Training School, Vineland, N. J., told the American Psychological Association meeting at New York. This indirect method of studying the mind was likened by Dr. Kreezer to the chemist's method of finding the chemistry of distant stars by an analysis of their light rays. There is no direct method for studying the brain; the nearest approach has been the anatomical study of the brain after death.

Muscles of idiots having a mental age of only three years respond differently to very mild electric currents than do normal persons. Their reaction resembles somewhat that of an animal who has had an injury to the higher centers of its brain or that of a fetus.

Science News Letter, October 6, 1934

ZOOLOGY

Monkey of Mountain Snows Comes to Smithsonian

MONKEYS and snow are seldom thought of as near neighbors; but the Smithsonian Institution has just received a specimen of a monkey whose home is in the mountains of central Asia, just below the line of everlasting snow. It is one of the rarest monkeys in existence, and very few specimens have ever been brought to either European or American museums.

Scientifically, the monkey is known as *Rhinopithecus*, which is Greek for "nose-monkey"; the creature has a sharply pointed, decidedly retroussé nose. Its ogreish face ranges in color from green to turquoise, in which are set very large, bulging eyes. Surrounding the face is a fringe or beard of long orange hair. The rest of the body is covered with hair six or seven inches long and varying from gold to silver.

Science News Letter, October 6, 1934

ENCE FIELDS

MEDICINE

Pneumonia Helped By Treatment For Tuberculosis

LOBAR pneumonia is being treated with encouraging results by a method originally devised for the treatment of tuberculosis of the lungs, Dr. Francis G. Blake of Yale Medical School reported at the meeting of the Connecticut Clinical Congress.

The method, known to scientists as artificial pneumothorax, consists in putting the affected lung to rest by decompressing or collapsing it. In tuberculosis this promotes healing and prevents extension of the disease.

The mortality rate from lobar pneumonia can be greatly reduced by this method of treatment, experience with a large series of cases at the New Haven Hospital showed. The lung must be collapsed on or before the third day of the disease. If no adhesions are present from previous pleurisy, the treatment causes a dramatic drop in temperature and relief from pain.

Science News Letter, October 6, 1934

CHEMISTRY

Titanium Common, But Hard to Separate

ONE OF the commonest chemical elements of the 92 within the earth is titanium. Few people have ever heard of it. Only eight elements known to science are more prevalent. Yet titanium, paradoxically, is called "rare" by scientists because it is most difficult to obtain in its pure form.

Huge deposits in mountain regions like those of the Adirondacks show titanium mixed with iron but how to get the iron separated from the titanium is still a problem in the experimental stage of technology.

Yet titanium has its uses and is made commercially, Profs. M. A. Hunter and A. Jones of Rensselaer Polytechnic Institute reported to the Electrochemical Society at its New York meeting.

The very fact that titanium is so difficult to separate from other elements with which it has formed chemical compounds means that it is a great "joiner" among the metals. Disliking to exist alone when anything is near with which it can combine, titanium forms compounds difficult to break down.

This "gregariousness," if one can give a metal a personality, is the keynote of its usefulness in industry. In the iron and steel industry titanium is used as a "scavenger."

In its scavenger role titanium "eats" oxygen and nitrogen. A small amount of it dropped into a great ladleful of steel soon finds the titanium going after oxygen and nitrogen present with great avidity. Combining readily with carbon to form titanium carbide the metal can remove an excess of this element also.

Science News Letter, October 6, 1934

METEOROLOGY

Above-Normal Rainfall For Drought States

THERE is no doubt about the Drought. That unexpected evil is definitely gone, for this year at least.

U. S. Weather Bureau rainfall records for September, as supplied to Science Service by Senior Meteorologist J. B. Kincer, show abnormally heavy rainfall in most of the principal crop states of the Midwest, Northwest and South. The month's soaking ranged from 213 per cent. of the normal September rainfall in Missouri, about the worst afflicted of all the Corn Belt states, to just about normal in states like Arkansas and Ohio.

As if to show how really efficient raining could be accomplished if one tried hard enough, the District of Columbia established an all-time record with something over 17 inches of moisture during the month—over five times its normal September rainfall. A single day's downpour came to more than three inches.

Some of the states that were reported as still in the subnormal column at the end of the first twenty days of September have pulled up to normalcy in rainfall percentage. Thus, Montana and Ohio, which were on the minus side of the ledger on Sept. 20, each reported 201 per cent. of the normal September rainfall at month-end. Unfortunate North Dakota, however, is still a drought state, with only 45 per cent. of normal precipitation for the month. Subnormal precipitation in some of the Southeastern states is less serious, since these have been receiving good rains during the summer.

Science News Letter, October 6, 1934

ETHNOLOGY

Indian Awed by Story Of Dionne Quintuplets

THE white race gets a scarcely merited credit for a high birthrate, in the mind of at least one Montagnais Indian of the Big Woods of northern Quebec Province. Prof. John M. Cooper, anthropologist of the Catholic University of America, brought the story back with him, on his return from a sojourn among the primitive tribes of the James Bay region, where he has been gathering data on the old Indian ways and beliefs, before the old people who remember them all die off.

Prof. Cooper was talking with a middle-aged Indian. The conversation turned on twins in Indian families. To keep up his end of the discussion, and not weary his companion with too many questions, the American scientist told the Indian about the remarkable case of the Dionne quintuplets.

The redskin was silent for a little while. Then he spoke: "Huh! No wonder there are so many white men!"

Science News Letter, October 6, 1934

PSYCHOLOGY

Workers' Pay Is Not Based on Intelligence

PECUNIARY rewards in our present economic system are based but little on the intelligence or educational capacity of the workers. This declaration was made before the New York meeting of the American Psychological Association by Dr. Paul S. Achilles, of the Psychological Corporation, as one of the conclusions from a statistical study of 10,000 unemployed persons examined at the Adjustment Service for unemployed adults, in New York City.

The highest salary previously obtained by these 10,000 persons was, on the average, $37.50 a week for the men and $30.33 a week for the women. The majority were white collar workers, 60 per cent. being high school graduates and about 20 per cent. of these having also college degrees. The ages ranged from 17 to over 60, with the average about 26.

No relationship was found between emotional stability as measured by the Bernreuter inventory, and the length of unemployment. The scores on this test were, however, found to be related to the type of home the individual lived in.

Science News Letter, October 6, 1934

ASTRONOMY

Saturn Shines in the Evening Sky

Approach of Winter is Heralded by Return of Taurus With His Red Eye, Aldebaran, to the Eastern Heavens

By JAMES STOKLEY

THE RETURN of the constellation of Taurus, the bull, to the evening skies in October comes as a warning of the approach of winter. Low in the east at about 10 p. m. on the first, 9 p. m. on Oct. 15 and 8 p. m. on Oct. 30, as shown in the maps, you can see a red star, Aldebaran, which marks the animal's eye, and the V-shaped group of stars—the Hyades—that outline his face. Above is a little cluster of faint stars which forms the Pleiades, the famous seven sisters of song and story. Auriga, the charioteer, shines in the northeast, with the brilliant, creamy white Capella.

Low in the south appears Fomalhaut, in Piscis Austrinus, the southern fish. Considerably higher, nearly overhead, are four stars forming the "Great Square in Pegasus." Only three, however, are in this constellation. The fourth, to the northeast, is in the neighboring constellation of Andromeda. Still farther north can be seen the W-shaped group of Cassiopeia, the queen, seated on her throne.

In the Southwest, the Eagle

Also in the south, higher and west of Fomalhaut, is the planet Saturn, not a star at all but a member of the family of bodies, including the earth, which revolve around the sun, forming the solar system. In the southwest can be seen a bright star, attended on either side by fainter stars, Altair, in Aquila, the eagle. Farther to the north is the brighest star of the northern hemisphere, Vega, in Lyra, the lyre. Above can be seen the northern cross, or Cygnus, the swan. The bottom of the cross, which is the swan's head, points to the southwest. At its top, in the bird's tail, is the star Deneb.

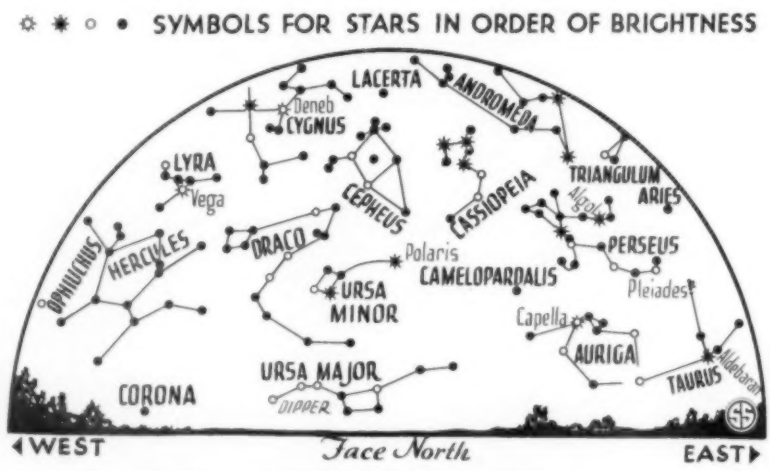
The Great Dipper, part of Ursa Major, the great bear, is seen during October evenings low in the north, at nearly its farthest position below the north pole of the sky, about which it circles like all the stars. The dipper, however, is closer to the pole than the northern horizon, and so it can never get below it, as seen from the United States. Therefore, it belongs to the group of circumpolar constellations, which never set, but can be seen on any clear night, when one has a view to the north. Cassiopeia is another circumpolar constellation.

Although the world's greatest observatories are to be found in the United States, and American astronomers lead the world, until recent years there has not been so much opportunity for the public to appreciate the wonders of the heavens as on the other side of the ocean, particularly in Central Europe. Most of our observatories have regular nights, perhaps as often as once a week, when visitors are admitted to look through one of the telescopes, and at the Allegheny Observatory in Pittsburgh one telescope has been put aside for them every night. However, in Europe there are a number of "Urania" observatories, each in a central location in a large city. The entire institution is dedicated entirely to the public, and for a small admission charge visitors may come and see, and hear explained, the celestial sights shown by the telescope. In the last decade, the work of the observatories has been supplemented by the remarkable Zeiss planetarium, which reproduces in a realistic manner the night skies as seen from any part of the earth at any time, and with their motions speeded up at will.

After eighteen such instruments had been set up in as many European cities, the first American planetarium opened in Chicago in 1930, and the second a year ago in Philadelphia. The third is nearing completion in Los Angeles, the fourth is under construction in New York, and still other American cities have them in contemplation, so that before long we may have nearly as many in this country as they have in Europe.

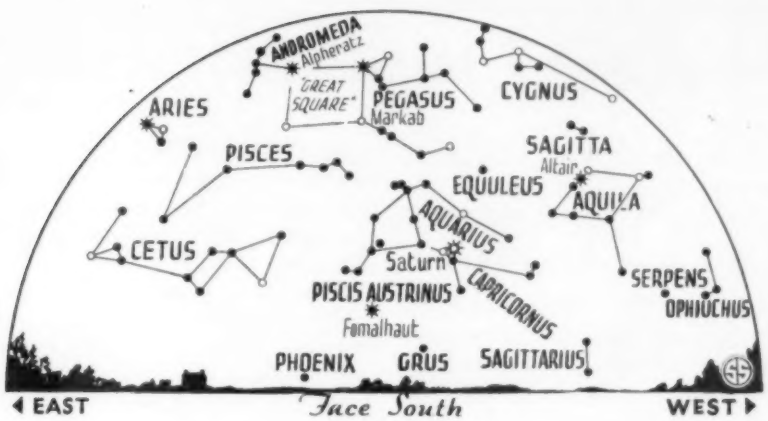
At the Adler Planetarium

At the Adler Planetarium in Chicago, to which many visitors have been attracted during the past two summers as a result of the World's Fair, several small astronomical telescopes are regularly used on the roof; through them the visitors can see, greatly magnified, the actual objects that they saw reproduced in the synthetic sky inside. At the Franklin Institute Museum, in Philadelphia, of which the Fels Planetarium is part, there is an observatory that is open to the public every clear evening. This is equipped with two large telescopes, a refractor, with a lens ten inches in diameter, and a reflector, in which a concave mirror brings to a focus the rays of star light, with a mirror two feet in diameter. This is the largest telescope in the country primarily for public use. The Griffith Planetarium in Los Angeles will have a



THE DIPPER COMES TO EARTH

Too close to the pole ever to descend below the northern horizon, this familiar figure in the sky is now almost as low as it ever reaches.



THE GREAT SQUARE

High overhead on these first fall evenings rides the winged horse, Pegasus, marked by the familiar square of four stars, one of which is in the neighboring constellation, Andromeda.

twelve-inch refractor for visitors, and the Hayden Planetarium in New York will also have some telescopic equipment. Probably with all these precedents, any other American planetarium will have to provide an observatory in addition, and so there is every prospect that in a few years Americans will have as many opportunities for enjoying telescopic observations of the stars and planets as have our European cousins.

College Observatories

But in the meantime, if you do not happen to live near one of the cities already equipped, there is probably some college observatory not far from you, where you can look through their telescope at certain times. And then, of course, in many cities there are itinerant "astronomers" who set up their telescopes on some prominent street corner, where you can see the stars for a dime a look. More can be seen through even a small telescope than most people realize, so you can often get a pretty good view through one of these instruments, although the explanation that accompanies it is not always of the highest degree of scientific accuracy.

And also, when looking through such a telescope, do not be too much impressed by the assortment of gadgets with which the telescope may be equipped, for probably most of them are there solely for the purpose of making an impression. Such telescopes are often not as large as they seem. I remember seeing one, in a certain large city, with a tube at least twenty inches in diameter, so that the lens might have been 18 inches across, which would be large even for a college observatory. As a matter of fact, such a large instrument could not possibly have been used on the rather rickety tripod that was under it. A little later, I was able to get a look into the front of the telescope, and found, as I had expected, a small telescope, not more than four inches in aperture, way down inside. The big tube was pure camouflage.

Later I saw this same system in use in a very large observatory equipped with one of the world's largest telescopes, but here there was a good excuse for doing so. The mounting of the telescope, a reflector, was completed some time before the optician had finished the mirror. Having a perfectly good mounting, the director wanted to use it for photographing the sun, so he put a six-inch lens in the tube which was intended for a mirror many times as large. Then, when visitors came to the observatory they were allowed to look through the telescope and had all the thrill of seeing a really big instrument in operation. The six-inch lens had the same focal length as the big mirror, so it magnified just as much and when it was turned on the moon or a bright planet there was plenty of light, so for such things the big glass was really unnecessary. However, this telescope, and the large mirror, were finally completed some years ago, and the visitors that have been admitted since then have been able to see all that it will show.

Rain No Handicap

There is another dodge sometimes perpetrated by the proprietors of the street corner telescopes. The skies are sometimes cloudy, and occasionally many days may go by without having the moon or any bright planet properly placed in the sky. But these gentlemen may show them anyhow. They make a small picture of the object, painted on glass and colored, like a stereopticon slide, and place it in the eyepiece. Then the telescope is turned in the general direction of a street light, so that the light shines down the tube. A more elaborate arrangement is to place a small electric lamp inside the telescope, operated by a flashlight battery. When you look through the telescope you think you are looking at the object in the sky, millions of miles away, instead of at a picture just alongside your nose. It is easy to tell whether this is the case, however. Push on the eyepiece and jar the telescope. If the object is in the tube, it will stay right in the center of the field, but if it is in the sky, the jar will move it out of the field or at least to one side.

Good Precedent

This trick has good scientific precedent, for it was used by no less a person than the great Sir William Herschel, discoverer of the planet Uranus, and one of the greatest astronomers of all time. It is related that after he became famous, and was given a pension by King George III, of England, the Queen expressed a desire to look through his telescope. He brought one around to Windsor Castle and all was set for the royal observations that evening, when the weather was disrespectful enough to turn cloudy. Unwilling to disappoint the Queen, Sir William prepared a picture of Saturn, set it up behind a lamp in the garden, and pointed his telescope toward it. The Queen looked through it, and apparently never detected the fraud!

Luckier Than the Queen

But if you can get to an observatory this month and look through the telescope, you will probably be more fortunate than the Queen and will see the genuine Saturn. In the evening now it is in the south, as well placed for observation as it will be at any time this year, so it is now the most popular object of the observatory visitors. They will see the famous rings of Saturn, a vast, thin cloud of myriads of tiny moonlets, perhaps no larger than baseballs, each revolving around the globe of the planet in its own orbit, but so crowded together that from the distance of the earth they look like solid rings. Saturn's globe is 72,000 miles in diameter, a little smaller than Jupiter, with 87,000 miles, but far greater than

Phases of the Moon

		E. S. T.
New Moon	October 8	10:05 a. m.
First Quarter	October 15	2:29 p. m.
Full Moon	October 22	10:01 a. m.
Last Quarter	October 30	3:22 a. m.

the 7,900 miles of the earth. The rings, however, are far larger than any planet, for the outer one is 170,000 miles in diameter, and the entire system is about 43,000 miles wide, so that five earths might roll about on them, side by side, without touching. So if you have any opportunity at all, look at Saturn through a telescope and you will be sure of an interesting sight. Perhaps, like many observatory visitors, you will be surprised to find that it "really does look like the pictures."

Science News Letter, October 6, 1934

PATHOLOGY

Filterable Virus Activity Ruled by Host Cell

WHEN a filterable virus invades a living cell and starts its disease-causing activities, it apparently enters into a very close relationship with its involuntary host. For the rate of activity of the virus depends to a large extent on the rate at which the cell is conducting its own life activities.

This was among the points discussed in a recent address on these strange invisible disease-causing agents by Dr. R. Manninger, director of the State Institute of Veterinary Hygiene at Budapest, Hungary, before the Twelfth International Veterinary Congress in New York. These filterable viruses can not be seen with any microscope and can pass through the pores of a fine porcelain filter. However, since it has been recently discovered that many quite familiar, microscopically visible bacteria have the power of "dissolving" themselves into an invisible, filter-passing phase, Dr. Manninger suggested that the name "filterable virus" has lost its original significance, and he proposed instead the name "ultravirus" for the permanently invisible, filter-passing agents of disease.

At the same meeting, Dr. F. Gerlach, director of the State Institute for Animal Hygiene at Mödling, Austria, called attention to the seemingly greater activity by these viruses in provoking living tissue to form defensive "antibodies" of the nature of anti-toxins. These anti-viruses, he said, are formed more certainly, and confer longer and stronger immunity on animals recovering from virus diseases, than is the case with the corresponding process in animals recovering from bacterial diseases. The reason for this phenomenon, he added, is still quite unknown.

Although the filterable viruses, or ultraviruses, have been known for a long time as the causes of a great variety of plant and animal sicknesses, their real nature is still in doubt. In some respects they act like non-living enzymes or digestive ferments, in others, like genuinely living organisms. For this reason the non-committal name "virus-enzymes" has been proposed for them.

Science News Letter, October 6, 1934

From Page 211

also the possession of positive and desirable qualities is increasingly necessary to measure the desirability of future immigrants.

When we analyze our recent immigrant groups in regard to assimilability and inborn quality, is it primarily the matter of race or of the individual worth which counts? The answer is "both"; race for general assimilability, hence the quota-allotment of numbers of immigrants annually admissible for each of the several foreign countries; and individual quality to make sure that the applicant for admission is no criminal, or potential inadequate who would become a member of any of the socially incompetent groups, but above all that the family-stock which produced the particular would-be immigrant is sound physically, mentally and in character—a stock which has produced many other individuals of the sort which the best Americans would like to see marry their own near-kin—for this is what will happen in the long run.

If the responsible American citizen, who decides American immigration policy today, could look only a few generations into the future he would find that his own great-great-grandchildren would, very likely, trace back in their ancestral tree not only to the distinguished gentleman who helped to determine present immigration policy but also to the immigrant whom he admitted.

It is sound biology to fight for American ideals.

Science News Letter, October 6, 1934

SUBSCRIPTION ORDER COUPON

Science News Letter,
21st and Constitution Avenue,
Washington, D. C.

Please ☐ start ☐ renew my subscription to SCIENCE NEWS LETTER as checked below:

☐ 2 years, $7 ☐ 1 year, $5

and send me a bill.

Name.....

Street Address.....

City and State.....

19123

PSYCHOLOGY

Whole Brain Not Needed For Handling Money

Experiments With Apes and Monkeys Show This Ability Is Retained After Loss of Frontal Association Area

YOU DON'T have to have all your brains to handle and use money.

This is the conclusion that might be drawn from experiments with the famous monkeys and apes at Yale who have been taught to earn varicolored poker chips and then spend them for food delivered to them by automatic vending machines.

These "financier" apes and monkeys have aided in a new experiment, designed to explore further the mechanism of the brain. Drs. C. F. Jacobsen and J. B. Wolfe of Yale's Laboratories of Comparative Psychobiology have reported that even after injury has deprived the apes of what the scientist call the frontal association area of the brain, they retain some of their financial ability.

They can earn money. They can distinguish valuable "coins" from worthless ones. They spend their wealth for food at automatic vending machines appropriately called "chimpomats."

Could Go On Spending

A financier or banker so unfortunate as to suffer a lesion of his frontal association brain area might be able to go on as usual spending his money. The ability to recognize the value of money and to exchange it for valuables is one which survives even in the face of a lack of this important part of the brain. But he might easily be cheated. For like a young child, he might not know the difference between nickels and dimes. The injured banker would suffer a loss of memory of events in the immediate past, it appears from Dr. Jacobsen's experiments on primates, which were conducted with his associate, Dr. Wolfe.

The animals were allowed to watch the experimenter hide a coveted morsel of food or a "coin," which they could later exchange for food, under one of two cups. If they were released immediately, they would practically always go immediately to the correct cup and secure the reward. But if they were held in check for even so brief a time as two seconds, they would have forgotten which was the right cup. Healthy animals can remember where to look for as much as five minutes.

Similarly, the injured animals were able to reach out of their cages, secure a stick for a tool, and with it draw in a banana which lay temptingly just out of arm's reach. More than that, when the treat was farther away, they could use the stick to reach for a longer one and then make use of the longer stick to get the food. But when the food was placed outside one end of the cage and the stick outside the other end, the problem was too much for them. They could not keep in mind the location of the food long enough to go to the other end of the cage for the stick.

Nevertheless, the memory of how to use the stick, and how to perform the complex trick of taking a coin and placing it in a slot machine to secure food, were retained. The apes were even able to select a yellow chip which would buy them a piece of food in preference to a green one which was the "lead coin" of the experiment and had no exchange value. They forgot, however, a previous ability to choose a red chip which would buy two pieces of food in preference to the yellow one with half the value.

The association area of the frontal lobes of the brain is thus shown to be essential to the ability to keep in mind more than one aspect of a problem while handling them to obtain a solution, and necessary for memory of events of the immediate past, Dr. Jacobsen concludes. The memory of long past events and well-learned habits are retained even after the loss of this brain area.

Like Aged's Loss of Memory

The situation of the injured animals is somewhat parallel to that of the old persons suffering through senility from "loss of memory." Reminiscences of early childhood and ingrained habits are often retained very well indeed, although the person can not recall what day of the week it is or where he laid down his spectacles just a moment ago.

The results indicate clearly a division of labor among different parts of the brain in primates. In this man and his nearer relatives differ from the lower animals such as rats.

Science News Letter, October 6, 1934

THEY DON'T NEED ALL THEIR BRAINS

These apes were taught at Yale University to select a "coin" with exchange value from among worthless ones and to spend it in an automatic vending machine. New experiments have shown that this ability is retained even after loss of the frontal association area of the brain.

PHYSICS

Cosmic Rays and Ozone Layer Studied in New Flights

NEW studies of the stratosphere 12 to 20 miles above the surface of the earth are being made in Germany by the world-famous Prof. Erich Regener of the Physical Institute at Stuttgart. Small free-flight balloons are used in the investigations. They carry aloft automatic instruments in the manner proposed in the new research program of Dr. Arthur H. Compton of the University of Chicago.

Studies of cosmic ray intensities up to altitudes of 17.5 miles, Prof. Regener reports to *Nature*, indicate cosmic rays have the same specific ionizing power over the whole region investigated from the surface of the earth up to the greatest heights studied.

Other balloons bearing a quartz spectrograph were sent up to altitudes of 13, 12.5 and 19.5 miles. An examination of sunlight at these heights disclosed that at 13 miles 40 per cent. of the protective layer of ozone in the earth's atmosphere was then below the instrument. At 19.5 miles 70 per cent. of the ozone was below the instrument.

Ozone is atomic instead of molecular oxygen. It has a characteristic odor noticed when a quartz arc is operating and occasionally after a lightning bolt strikes near by. Because it strongly absorbs the ultraviolet rays of sunlight, ozone in the earth's atmosphere is often called a protective layer. Without ozone's presence sunlight would be so intense that plants, animals and people could not live on the earth as they do now.

Studies of the height of the ozone in the atmosphere were performed in collaboration with Dr. Victor H. Regener The cosmic ray studies were made with Dr. Georg Pfotzer.

Describing the results of the ozone studies, Prof. Regener declares, "These results are remarkable because they confirm recent calculations predicting that the height of the ozone layer is much lower than previously supposed."

Prof. Regener is a pioneer in the art of using small free-flight balloons to disclose conditions in the upper atmosphere. His high altitude studies of cosmic radiation have provided a large amount of data from which the nature of cosmic rays can be interpreted. His investigation of cosmic rays with instruments sunk far below the surface of Lake Constance, between South Germany and Switzerland, is also widely known. His stratosphere investigations have supplemented data obtained by similar research by Prof. Millikan, Prof. Auguste Piccard, and Dr. Arthur Compton.

Science News Letter, October 6, 1934

Do we di.cover truth or make it by our think ng?

Some Enigmas of Modern Science

by Guy Clinton

offers an opinion on this question. Relativity is quoted and analyzed in non-mathematical terms. Price in cloth 80c, in paper 60c. Address orders to

GUY CLINTON

124 Willow Avenue Takoma Park, Md.

RADIO

HOW PLANTS FIGHT DROUGHT

an address by

Dr. Howard E. Pulling

Professor of Botany at Wellesley College

Wednesday, Oct. 10, at 4:30 p. m., Eastern Standard Time, over Stations of the Columbia Broadcasting System. Each week a prominent scientist speaks over the Columbia System under the auspices of Science Service.

MEDICINE

Search For Something More Than Germ as TB Cause

SOMETHING in addition to the tuberculosis germ or bacillus is responsible for cases of tuberculosis. This was the consensus of opinion of tuberculosis experts who discussed the question at the meeting of the American Hospital Association. They did not, however, agree on what the additional causative factor may be.

The discussion was opened by Dr. C. H. Sprague of Broadlawns Polk County Public Hospital, Des Moines, Iowa.

Dr. Sprague pointed out and other physicians corroborated him that cases of tuberculosis have decreased unexpectedly during the period of economic depression. This led him and other tuberculosis workers to wonder whether the factors of good food, good homes, fresh air and cleanliness were of such importance in preventing tuberculosis as has been supposed. Examination of all children in order to detect possible cases of tuberculosis was universally accepted as a measure of prime importance in fighting the disease. According to some authorities, this examination should include school teachers, in order to rule out possible sources of infection from teacher to pupil.

The importance of recreation to keep up the tuberculous patient's morale and thus help him to fight the disease was emphasized by Dr. H. A. Pattison, of Livingston, N. Y. Dr. Pattison praised the work of the occupational therapist but declared that there should not be too much emphasis on craft work among tuberculous patients. Most of the patients because of their ailment are far below the normal in educational status, he points out, and therefore they should be given educational and intellectual amusement rather than craft work, in his opinion.

Science News Letter, October 6, 1934

BIOLOGY

Glass Model Shows How Rotifer Feeds

See Front Cover

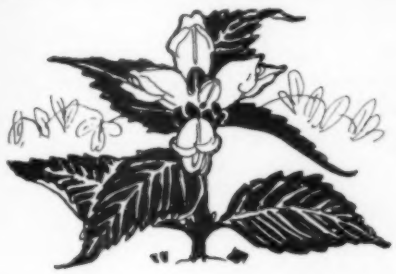
MADE LARGE enough to see without the use of a microscope, exquisitely modeled in glass as transparent as its own body, a super-heroic-sized image of a rotifer, one of the common tiny water-worms, is shown as it feeds on the filament of a fresh-water alga, *Spirogyra*. The hungry tiny scrap of life punctures a cell, sucks it empty like a thieving weasel at an egg, and then moves on to repeat the operation on the next cell.

The model represented on the cover of this week's SCIENCE NEWS LETTER is in the American Museum of Natural History in New York City. It is the handiwork of the noted artist in glass, Herman O. Mueller.

Science News Letter, October 6, 1934

BOTANY

NATURE RAMBLINGS *by Frank Thone*



Turtlehead

POETS have spent much verse—and justifiably—on the beauty and hardihood of the gentians. A poet is needed to celebrate the gentian's somewhat remote cousin, the turtlehead, which in its robust way has real beauty, and which holds its own against the creeping threat of winter quite as well as does the gentian. It is likely enough that even now one could find turtleheads still in good bloom, lurking as they do in sheltered ravines where there is plenty of trickling water.

The turtlehead grows on a tall, slender, strong stem like a gentian—a stem usually taller than a gentian's, and much more given to branching. In outer form the flower would be a closed gentian, had not some Gothic quirk of nature broken the radial symmetry of the gentian and substituted a two-lipped, bilaterally symmetrical structure. There really is some suggestion about it of a turtle's head. Botanists recognize this, too, and call the plant *Chelone,* which is Greek for turtle.

Though it blossoms during gentian time and looks from the outside like a sort of lopsided closed gentian, it really isn't as close kin to that flower as might be supposed at first. It is more nearly related to the lousewort and the toadflax.

There are a number of turtlehead species, ranging widely over this country. The commonest is the smooth turtlehead. *Chelone glabra,* a white-flowered sort. There are some others, however, that are exceedingly rare. One species, the pink turtlehead, was rediscovered near Washington a few years ago, after it had been lost for more than a century.

Science News Letter, October 6, 1934

MEDICINE

Financing Hospital Care For All is Major Problem

President of American Hospital Association Urges Coordination of Activities and Group Insurance

By DR. N. W FAXON, Strong Memorial Hospital, Rochester, N. Y.

TWO MAJOR problems confront the hospitals of the United States and Canada. First, the formulation of a definite plan for coordinating the facilities and work of governmental and non-governmental hospitals in providing hospital care for people who can not afford to pay for hospital care. Second, the development of a plan by which people of moderate or small means may finance their hospital care.

The coordinating of governmental and non-governmental hospital activities requires the definite acceptance on the part of local government of the responsibility for the care of indigent patients, either in governmental hospitals or through paying for their care in non-governmental hospitals, according to the available hospital facilities. A corollary of this is that voluntary hospitals should provide such portion of this care as their financial resources will allow. Such a course is dictated by the history of voluntary hospitals and by provision made in gifts and endowment which they have received. It is obvious that every community should make full use of existing facilities before building new hospitals.

Group hospital insurance offers a definite and adequate plan whereby self-supporting people may, through periodic payments upon the insurance principle, finance the cost of hospital care when needed. It should be established upon a non-profit basis as a community enterprise and should not and need not disturb present relationship between patient, physician and hospital. A more inclusive plan for health insurance might possibly develop from such hospital insurance plans.

From the standpoint of hospitals alone the problem facing voluntary hospitals is one of not reducing cost but of increasing revenue, through payment for services rendered to indigents and through increased use of existing facilities by paying patients. The acceptance by local government of responsibility for indigent patients would provide for the first and group hospital for the second condition.

While this would help hospitals and as such is eminently desired by them, the basic principles involved lie much deeper and rest upon that which is best for the community as a whole. It is the concern of the community as a whole to provide hospital facilities for the care of all classes of patients: the indigent, the well-to-do, and those of small means. It is indeed fortunate that the same plans will serve both the needs and welfare of the community and the needs and welfare of the hospital.

Science News Letter, October 6, 1934

METEOROLOGY

Meteorology Not Common As A College Course

METEOROLOGY is taught in only slightly over one-fifth of all American colleges and universities. This and other interesting figures on the teaching of weather-science were compiled by Woodrow C. Jacobs of the University of Southern California, and are published in detail in the Bulletin of the American Meteorological Society.

Of the various groups of institutions studied, the state colleges and universities made the best showing; 55 per cent. offering meteorological courses.

Science News Letter, October 6, 1934

VITALISM
and
MECHANISM
A DISCUSSION
between
HERBERT V. NEAL
Professor of Zoology, Tufts College
and
JAMES F. PORTER
Being a survey of these opposing theories from the point of view of a scientist and a layman.
50 Cents
SHERMAN M. GOBLE
105 W. Adams St. Chicago, Ill.

First Glances at New Books

Arctic Exploration

TO THE NORTH—Jeannette Mirsky *Viking,* 386 p., $3.75. Most people know scattered incidents of discovery and exploration in the Far North. Such names as Peary, Nansen, Andrée are familiar. But the entire story of the Arctic—2,000 years of man's struggle to find wealth, adventure, or a short cut from one side of the world to another—is a fascinating course in history somewhat overlooked in school curricula. This book is straight-forward enough and comprehensive enough to be "educational" and yet it manages to convey the adventurer's spirit to the fireside reader.

Science News Letter, October 6, 1934

Sociology—Psychology

LEISURE, A SUBURBAN STUDY—George A. Lundberg—*Columbia Univ. Press,* 395 p., $3.00. A study of how the people of Westchester County, New York, spend their leisure time. It was discovered that seven broad categories of activity account for 90 per cent of leisure time, and "the most important and common of these activities is the daily ceremonial of eating with its attendant sociability."

Science News Letter, October 6, 1934

Oceanography

REPORT OF THE STANDING COMMITTEE ON THE OCEANOGRAPHY OF THE PACIFIC—Thomas Wayland Vaughan, Chairman—*The University of Toronto Press,* 384 p. A reprint from the Proceedings of the Fifth Pacific Science Congress, 1933.

Science News Letter, October 6, 1934

General Science

YOUR GUIDE TO THE BUFFALO MUSEUM OF SCIENCE—*Pub. by the Museum.* Free.

Science News Letter, October 6, 1934

Ornithology

BIRDS OF THE CHICAGO REGION—E. R. Ford, C. C. Sanborn and C. B. Coursen—*Chicago Academy of Sciences,* 80 p., 50c. Concise descriptions of birds of a specific area, but without question applicable to a much larger territory than it professes to cover.

Science News Letter, October 6, 1934

Chemistry

PRACTICAL EVERYDAY CHEMISTRY—H. Bennett—*Chemical Pub. Co.,* 305 p., $2. Avoiding chemical theory as a scourge is this volume on how to make what you use. One can run the gamut from how to make a flexible bookbinding glue to the preparation of homemade Easter egg dyes. The formulae of hundreds of everyday compounds are listed. The smalltime dabbler in chemical industry may be appalled at some of the recipes given. Neutral cleansing cream, for example, calls for 80 pounds of mineral oils, 90 pounds of glycerin, ten pounds of perfume, and other ingredients: in all, 234 pounds.

Science News Letter, October 6, 1934

Physics

THE DIFFRACTION OF LIGHT, X-RAYS, AND MATERIAL PARTICLES—Charles F. Meyer—*University of Chicago,* 473 p., $5.00. Textbook on one of the most important fields of optics intended for graduate students in physics and their professors who are looking for a novel and improved exposition of the subject. The linking of diffraction phenomena in X-rays and material particles with the classic work in the field of light has not before been available in one volume.

Science News Letter, October 6, 1934

Physical Education and Hygiene

ADMINISTRATION OF HEALTH AND PHYSICAL EDUCATION—Jesse Feiring Williams and Clifford Lee Brownell—*W. B. Saunders,* 598 p., $3. This book gives practical directions for coordinating and making effective physical education and health education in schools. The authors emphasize that it is not enough merely to teach physiological facts and athletic skills and to discover and remedy physical defects; the child should be taught, in addition, to like wholesome living and wholesome recreation.

Science News Letter, October 6, 1934

Biology

ELEMENTS OF MODERN BIOLOGY—Charles R. Plunkett—*Holt,* 540 p., $3. All the illustrations in this book are diagrams, and the text is diagrammatically clear and direct. It forms a useful addition to college teaching literature.

Science News Letter, October 6, 1934

Dendro-Chronology

TREE RING BULLETIN, Vol. 1, No. 1—A. E. Douglass, editor—*Museum of Northern Arizona, Flagstaff,* $1.50 per year, 50c a copy. Tree rings would seem to be primarily a concern of botany or forestry, but under the enthusiastic and ingenious researches of Prof. Douglass and his school they have become very much a concern as well of such sciences as archaeology, astronomy, geology and climatology. To make researches in the study of tree rings available to such diverse groups with this common interest, a number of scientists in the Southwest have founded this modest journal, which for the present will appear quarterly.

Science News Letter, October 6, 1934

Architecture

A PICTURE BOOK OF HOUSES AROUND THE WORLD—Otta Taggart Johnston—*Harter Pub. Co.,* 32 p., 10c plus postage. A book for children—not the youngest—describing very nicely in verse an Alpine chalet, a sod hut in Lapland, a French chateau, and several score other dwellings. The pictures are black and white photographic studies.

Science News Letter, October 6, 1934

Electricity

DESIGN OF ELECTRICAL MACHINERY—H. Cotton—*Oxford Univ. Press,* 479 p., $9. Comprehensive and detailed treatment, based on lectures given by the professor of electrical engineering at University College, Nottingham, England.

Science News Letter, October 6, 1934

Mathematics

THE POETRY OF MATHEMATICS—David Eugene Smith—*Scripta Mathematica,* 91 p., cloth binding, 75c., paper binding, 50c. A compact collection of essays, non-mathematical in themselves but relating to subjects which mathematics suggests. Mathematics is shown not to be a cold, barren isolated subject, but a fine art whose concepts are interwoven with such widely different fields as science, religion and politics.

Science News Letter, October 6, 1934

Science News Letter will secure for its subscribers any book or magazine in print which was published in the United States. Send check or money order to cover regular retail price ($5 if price is unknown, change to be remitted) and we will pay postage in the U. S. When publications are free, send 10c. for handling. Address Book Dept., Science News Letter, 21st and Constitution Ave., Washington, D. C.